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Department of Environmental Quality
Division of Solid and Hazardous Waste

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April 23, 2003

Curtis Anderson, Manager
Chevron Products Company
Salt Lake Refinery
2351 North 1100 West
Salt Lake City, Utah 84116

RE: Statistical Procedure Approval for Post Closure Permit

Dear Mr. Anderson:

The Division of Solid and Hazardous Waste (Division) has completed its review of the Chevron Products Company, Salt Lake Refinery's (Chevron) permit modification request to change the method of statistical procedures required by the Post Closure Permit for the Reservoir Waste Management Area (RWMA) submitted on March 29, 2002.

Based on Chevron's explanation on the nature of the hydrogeologic conditions and groundwater mounding under the Reservoir Waste Management Area, the request to use the Mann-Kendall Trend Analysis in place of the Parametric ANOVA method is hereby approved. The decision to use the Mann-Kendall Trend Analysis is supported by information from Chevron, and discussions between Division staff members and Chevron and its representatives.

This modification request was submitted as a Class 1 requiring prior approval and as such may be implemented as per the conditions applicable to a Class 1 permit modification outlined in R315-3-4.3 (as incorporated by reference 40 CFR 270.42)

Should you have questions, please contact Matt Sullivan at 538-6858.

Sincerely,

ORGINAL DOCUMENT SIGNED BY DENNIS R DOWNS ON APRIL 23, 2003

Dennis R. Downs, Executive Secretary
Utah Solid and Hazardous Waste Control Board

DRD/MBS/cb

c: Delane McGarvey ,E.H.S., Director Davis County Health Department
Eric Johnson, U. S. EPA Region VIII

Mann-Kendall Test

The Mann-Kendall test is a non-parametric test for determining trends. It indicates whether a particular constituent has a statistically significant increasing or decreasing trend in an individual monitor well. The test will also indicate the absence of a statistically significant trend. Mann-Kendall is particularly useful since it has very few limitations. For example, sample data need not be in a particular distribution and missing values are allowed. Mann-Kendall can also use data reported as either a trace value or one less than the method detection limit by assigning a common value that is less than the lowest measured value. This is allowed because Mann-Kendall uses the relative magnitude of the values to determine a trend and not the measured values. Of the trend analysis tests available, Mann-Kendall is the most robust and simple. This reduces the chances for error during the statistical analysis. A more detailed discussion of the Mann-Kendall test can be found in Statistical Methods for Environmental Pollution Monitoring by Richard O. Gilbert (1987).